Terahertz Pioneers

A Series of Interviews With Significant Contributors to Terahertz Science and Technology

AS a tribute to individuals who have contributed significantly, and over many years, to the terahertz community, and as a guide and inspiration for those who are just beginning their professional association with this field of study, these transactions have included, on a regular basis, a series of biographical interviews with technical researchers who have appreciably impacted the THz community in a positive manner. In order to go beyond a strict technical review and to take better advantage of the information and commentary only available through a direct discussion, these articles take on a less formal style than the research articles that can be found within the remaining pages of the transactions. The Editor-in-Chief has taken some leeway in this regard, for the benefit of communicating more fully the character, experiences, and historic circumstances that have shaped our community and set the directions for our collective research. As a further means of assuring that the true flavor and circumstances of the contributions are expressed in the text, all of the articles are compiled after a face-to-face interview. The final text is shared with, and often helped considerably, by comments from the subject of the article. The Editor-in-Chief, with the support of the IEEE MTT-S Publications Committee, has chosen to incorporate these biographical articles within the more formal technical journal because of the diversity of disciplines that make up the THz community and the prior absence of a single unifying publication with sufficient outreach to extend across the whole of the RF and optical THz disciplines. The Editor-in-Chief hopes you will enjoy the short diversion of reading these articles as much as he himself enjoys the process of composing them.

For the seventh article in this series, we again return to the *tap root* of terahertz science, *radio astronomy*. This month we are extremely excited to relay some experiences from Caltech Professor Tom Phillips, whose pioneering career laid the groundwork for much of submillimeter-wave astronomy. Not only is he personally responsible for developing two of the key ultra-low noise receiver technologies that have pushed THz spectral line astronomy into outer space and into the public eye, but his Caltech Submillimeter Observatory (CSO) has been the basis for 75 doctoral theses and countless scientific papers from facility users around the globe since it started operations in 1987. Professor Phillip's list of supportive colleagues, former students and post-doctoral fellows is a *Who's Who* in THz science and astronomy[1] and we are very fortunate to be able to bring some of his history to you.

Unfortunately, these are uncertain financial times for scientists in the U.S. and around the world, as evidenced by the handover in May 2012 of operational funding support for the very successful Galex (Galaxy Evolution Explorer) Space Telescope, by the U.S. National Aeronautics and Space Administration to *private* donors[2], and the recently launched Petridish website[3] that brings research science funding requests not to government agencies or Foundations, but directly to the general public! Astronomy has not escaped the budget axe, and the US National Science Foundation has made a decision to stop funding the Caltech Submillimeter Observatory, which will close its dome shutters sometime before the end of 2012 if alternate financing is not forthcoming. Hopefully, Professor Phillips' story will not end on such a setback to his own personal triumphs, and to our THz community as a whole. Perhaps some of the experiences that he has shared with us in this article, will help us all better understand *and appreciate* the enormous effort and personal dedication that have gone into the great THz projects that form the foundations of our field.

PETER H. SIEGEL, *Editor-in-Chief*
Departments of Biology and Electrical Engineering
California Institute of Technology
Founder, Submillimeter Wave Advanced Technology (SWAT) team
NASA Jet Propulsion Laboratory
Pasadena, CA 91109 USA

[1]*Submillimeter Astrophysics and Technology: A Symposium Honoring Thomas G. Phillips*, Edited by D.C. Lis, J.E. Vaillancourt, P.F. Goldsmith, T.A. Bell, M.Z. Scoville and J. Zmuidzinas, Astronomical Society of the Pacific Conference Series, San Francisco, CA, Feb. 23-24, 2009, vol. 417.

[2]NASA Lends Galaxy Evolution Explorer to Caltech," NASA Press Release, May 15, 2012, available at www.galex.caltech.edu/newsroom/glx2012-03r.html, or full story via live interview with Principal Investigator, Professor Chris Martin at American Public Media's, The Story, "Saving Galex", July 16, 2012 available at http://thestory.org/archive/the_story_71712_full_show.mp3/view

[3]Available: http://www.petridish.org

Digital Object Identifier 10.1109/TTHZ.2012.2212078

Thomas G. Phillips shares his life and his love of radio astronomy with his wife, astronomer and former Caltech staff member Jocelyn Keene, in Pasadena, CA, USA. At 75, he is still "commuting" to the observatory on the top of Mauna Kea, HI, that he first began working on in 1979, and that he is now in a life and death struggle to save from being closed down. Professor Phillips kindly consented to interrupt his "friends of the observatory" fund raising efforts, for this interview at his office in the new Thom Mayne designed Cahill Center for Astronomy and Astrophysics at the California Institute of Technology, Pasadena, on June 29th, 2012.